

**567—69.5(455B) Primary treatment—septic tanks.****69.5(1) General requirements.**

*a. Septic tank required.* Every onsite wastewater treatment and disposal system, except mechanical-aerobic systems, shall have as a primary treatment unit a septic tank as described in this rule. All wastewater from the facility serviced shall discharge into the septic tank (except as noted in “d” below).

*b. Easements.* No septic tank shall be located upon property under ownership different from the ownership of that property or lot upon which the wastewater originates unless easements to that effect are legally recorded and approved by the proper administrative authority.

*c. Effluent discharge requirements.* All septic tank effluent shall discharge into a secondary treatment system in compliance with this rule or other system approved by the administrative authority according to rule 69.18(455B).

*d. Prohibited wastes.* Septic tanks shall not be used for the disposal of chemical wastes or grease in quantities which might be detrimental to the bacterial action in the tank or for the disposal of drainage from roof drains, foundation drains, or area drains.

**69.5(2) Capacity.**

*a. Minimum capacity.* The minimum liquid holding capacity shall be as specified in the following table (capacity may be obtained by using one or more tanks):

up to and including 3-bedroom homes	1,000 gal.
4-bedroom homes	1,250 gal.
5-bedroom homes	1,500 gal.
6-bedroom homes	1,750 gal.

Two hundred fifty gallons of capacity shall be added to each of these tank volumes if a kitchen garbage disposal unit, water softener, or a high volume water use fixture such as a whirlpool bath is to be used.

*b. Other domestic waste systems.* In the event that any installation serves more than a 6-bedroom home or its equivalent, or serves a facility other than a house and serves the equivalent of 15 persons or less (1,500 gal/day), approval of septic tank capacity and design must be obtained from the administrative authority. Minimum septic tank liquid holding volume shall be two times the estimated daily sewage flow.

*c.* For wastewater flow rates for nonresidential and commercial domestic waste applications under 1,500 gal/day, refer to Appendix A.

*d. Minimum depth.* Minimum liquid holding depth in any compartment shall be 40 inches.

*e. Maximum depth.* Maximum liquid holding depth for calculating capacity of the tank shall not exceed 6½ feet.

*f. Dimensions.* The interior length of a septic tank should not be less than 5 feet and shall be at least 1½ times the width (larger length-to-width ratios are preferred). No tank or compartment shall have an inside width of less than 2 feet. The minimum inside diameter of a vertical cylindrical septic tank shall be 5 feet.

**69.5(3) Construction details.**

*a. Fill soil.* Any septic tank placed in fill soil shall be placed upon a level, stable base that will not settle.

*b. Compartmentalization.* Every septic tank shall be divided into two compartments as follows (compartmentalization may be obtained by using more than one tank):

(1) The capacity of the influent compartment shall not be less than one-half nor more than two-thirds of the total tank capacity.

(2) The capacity of the effluent compartment shall not be less than one-third nor more than one-half of the total tank capacity.

*c. Inlet/outlet.* The invert of the inlet pipe shall be a minimum of 2 inches and a maximum of 4 inches higher than the invert of the outlet pipe.

*d. Baffles.* Four-inch diameter schedule 40 plastic pipe tees shall be used as inlet and outlet baffles. Inlet tees shall extend at least 6 inches above and 8 inches below the liquid level of the tank. The inlet tee shall extend below the liquid level no more than 20 percent of the liquid depth. The outlet tee shall extend above the liquid level a distance of at least 6 inches and below the liquid level a distance of at least 10 inches but no more than 25 percent of the liquid depth. A minimum clearance between the top of the inlet and outlet tees and the bottom of the tank lid of 2 inches shall be provided. A horizontal separation of at least 36 inches shall be provided between the inlet baffle and the outlet baffle in each compartment.

A horizontal slot 4 inches by 6 inches, or two suitably spaced 4-inch diameter holes in the tank partition, may be used instead of a tee or baffle, the top of the slot or holes to be located below the water level a distance of one-third the liquid depth. A ventilation hole or slot shall be provided in the partition, at least 8 inches above the liquid level.

*e. Access.* Access must be provided to all parts of septic tanks necessary for adequate inspection, operation, and maintenance.

An access opening shall be provided at each end of the tank over the inlet and outlet. These openings shall be at least 18 inches in the smallest dimension if the tank has no other openings. Alternatively, a single opening at least 24 inches in diameter may be provided at the center of the tank allowing access to both compartments, with two smaller openings at least 6 inches in diameter over both inlet and outlet.

If the top of the tank is to be greater than 12 inches below the finished ground surface, a riser at least 24 inches in diameter must be installed over each manhole of 18 inches in diameter or more to bring the top of the manhole lid to within 6 inches of the finished ground surface.

**69.5(4) Construction.**

*a. Materials.* Tanks shall be constructed of poured concrete or plastic resistant to corrosion or decay and designed so that they will not collapse or rupture when subjected to anticipated earth and hydrostatic pressures when the tanks are either full or empty. Metal tanks are prohibited.

*b. Dividers.* Tank divider walls and divider wall supports shall be constructed of heavy, durable plastic, fiberglass, concrete or other similar corrosion-resistant materials approved by the administrative authority.

*c. Inlet and outlet ports.* Inlet and outlet ports of pipe shall be constructed of heavy, durable schedule 40 PVC plastic sanitary tees or other similar approved corrosion-resistant material.

**69.5(5) Wall thickness.** Minimum wall thickness for tanks shall conform to the following specifications:

Poured concrete	6 inches thick
Poured concrete, reinforced	4 inches thick
Special concrete mix, vibrated and reinforced	2.5 inches thick
Fiberglass or plastic	.25 inches thick

**69.5(6) Concrete specifications.** Concrete used in precast septic tank construction shall have a maximum water-to-cement ratio of 0.45. Cement content shall be at least 650 pounds per cubic yard. Minimum compressive strength ( $f'_c$ ) shall be 4,000 psi (28 Mpa) at 28 days of age. The use of ASTM C150 Type II cement or the addition of silica fume or Class F fly ash is recommended.

**69.5(7) Tank bottoms.** Septic tank bottoms shall conform to the specifications set forth for septic tank walls except special mix concrete shall be at least 3 inches thick.

**69.5(8) Tank tops.** Concrete or masonry septic tank tops shall be a minimum of 4 inches in thickness and reinforced with 3/8-inch reinforcing rods in a 6-inch grid or equivalent. Fiberglass or plastic tank tops shall be a minimum of 1/4 inch in thickness and shall have reinforcing and be of ribbed construction.

**69.5(9) Reinforcing steel placement.** The concrete cover for reinforcing bars, mats, or fabric shall not be less than 1 inch.

**69.5(10) Bedding.** Fiberglass or plastic tanks shall be bedded according to manufacturer's specifications. Provisions should be made to prevent flotation when the tanks are empty.

**69.5(11) Connecting pipes.**

*a. Minimum diameter.* The pipes connecting septic tanks installed in series and at least the first 5 feet on the effluent side of the last tank shall be a minimum of 4-inch diameter schedule 40 plastic.

*b. Tank connections.* All inlet and outlet connections at the septic tanks shall be made by self-sealing gaskets cast into the concrete or formed into the plastic or fiberglass.

*c. Joints.* All joints in connecting schedule 40 plastic pipe shall be approved plastic pipe connections such as solvent-welded or compression-type gaskets.

*d. Pipe in unstable ground.* Schedule 40 plastic pipe shall be used extending across excavations or unstable ground to at least 2 feet beyond the point where the original ground has not been disturbed in septic tank installations. If the excavation spanned is more than 2 feet, it must be filled with sand or compacted fill to provide a firm bed for the pipe. The first 12 inches of backfill over the pipe shall be applied in thin layers using material free from stones, boulders, large frozen chunks of earth or any similar material that would damage or break the pipe.